

RCA Institutes, Inc
132 West 31st Street | New York, NY 10001



FIRST CLASS

U.S. POSTAGE

PAID 6 CTS

PERMIT 416

RCA

T NELSON SYS CONSULT
BOX 1546
POUGHKEEPSIE N Y 12603



Bradford I. Daggett
Director
Institute for
Professional Development

Dear Engineer:

If you are involved in the logic design of digital equipment or systems, you are in one of the most dynamic engineering fields of today.

New and powerful techniques are being discovered which are increasing the designing capabilities of engineers like yourself.

Many of the techniques are tremendous time savers and facilitate the handling of multiple functions with ease. To name a few, these new methods include: the Mahoney Map, designation numbers and the matrix approach.

If you are finding it difficult to keep up, you are not alone. However, keeping you up-to-date is our job.

To this end, we invite you to join the hundreds of engineers throughout the United States who have attended our five-day seminar - logic design. From Synthesizing the simple to the complex, this seminar has gained wide acclaim.

The overall questions which the seminar undertakes to answer are:

How can a systematic numerical approach solve most of your logic design problems?

What is the optimum logic mapping technique for any number of inputs?

How can you gain a maximum degree of logic simplification?

How can you select the most straight-forward practical approach for each design problem?

How can you maximize reliability and at the same time, minimize redundancy?

Our logic design techniques are the direct result of detailed research by our highly qualified Technical Planning Board. Two of these men will be your lecturers throughout the program.

Who could be more qualified to impart these revolutionary ideas to you, than the men who have helped research and develop them?

To ensure your understanding of the material, we place heavy emphasis on audio-visual aids and have prepared special lecture notes to minimize the burden of note taking.

BACKGROUND OF THE INSTITUTE

Logic Design is one of several technical and managerial seminars developed and presented by RCA Institute for Professional Development. Part of RCA Institutes, a subsidiary of RCA.

Our philosophy in all programs is to provide you with the latest detailed practical information--and to make it immediately job applicable.

In addition, we strive to present our material in the clearest most concise manner possible. The combination of highly qualified lecturers, modern audio-visual communications techniques and the superbly researched material accounts for our extraordinary success.

THE PROGRAM

The program utilizes unique numerical and graphical approaches which lead you to the rapid synthesis of logic circuits. These techniques as applied to digital design are of greater efficiency than, and largely bypass the present day techniques of Boolean Manipulation.

What makes this program unique is the number of tools which are presented and the way in which these tools are coordinated for your use in everyday design problems.

You will actually do in class, design exercises, which will help you obtain a firm grasp of the material.

The minimum requirement for your attention is a bachelor's degree in mathematics, physics or engineering or the equivalent. Experience in switching circuits or digital systems may be substituted.

SCHEDULE

The action starts on Monday and continues daily through Friday from 8:30 a.m. to 4:30 p.m.

A handy reference flyer has been enclosed as a travel and reservation guide which also details for you the location and dates.

REGISTRATION INFORMATION

Because of the personalized type instruction, we are forced to limit registrations.

We will accept applications in order of receipt. First come/first served. For this reason, we suggest you apply immediately.

The fee is \$425.00 and includes your attendance, lecture materials and luncheons. A group rate of \$350.00 per enrollee is available if five or more enrollments are received at the same time.

In conclusion, let me repeat. Powerful, new techniques are being discovered in the field of Logic Design. Do you know how to use them?

Our files contain many letters from past attendees acclaiming the value of this seminar to them. We believe, we can help you.

Phone us or mail the enclosed application today.

Sincerely,

RCA INSTITUTES, INC.

B. I. Daggett

Bradford I. Daggett, Director
Institute for Professional
Development

REQUEST FOR SEMINAR REGISTRATION(S)

To: **RCA INSTITUTES, Inc.**

Institute for Professional Development

132 West 31st Street, New York, N.Y. 10001

REGISTRATION RATE FOR 5-DAY SEMINAR: \$425.00

LOGIC DESIGN



SYRACUSE, NEW YORK

NOVEMBER 11-15, 1968

☐ **Purchase Order Enclosed**

☐ **Check Enclosed**

☐ **Bill Company**

☐ **Bill Me**

Please register the following persons for the seminar, indicated above.

NAME _____

TITLE _____

NAME _____

TITLE _____

NAME _____

TITLE _____

AUTHORIZED BY _____

signature

title

FIRM'S NAME AND ADDRESS _____

A partial list of the companies that have sent personnel to attend our seminars

Aerospace Corporation
American Machine and Foundry Co.
The Bendix Corp.
Bell Telephone Laboratories, Inc.
The Boeing Company
Brown Engineering Co. Inc.
Chevron Research Co.
Colgate-Palmolive Co.
Columbia Broadcasting System, Inc.
Continental Oil Co.
Corning Glass Works
Douglas Aircraft Co. Inc.
E. I. DuPont DeNemours & Co.
Eastman Kodak Co.
Electronic Communications Inc.
Fairchild Camera and Inst. Corp.
Ford Motor Company
General Dynamics Electronics
General Electric Co.
General Motors Corp.
General Instrument Corp.
General Precision Equipment Corp.

Grumman Aircraft Engineering Corp.
Hamilton Standard
Hazeltine Corp.
Honeywell Inc.
ITT-Gilfillan Inc.
Johns Hopkins University
Jarrell-Ash Company
Leeds & Northrup Co.
Lockheed California Co.
The Magnavox Company
McDonnell-Douglas Corporation
Motorola Semiconductor Products Division
MIT
North American Aviation Inc.
North Electric Co.
Pan American World Airways
Philco-Ford
Pitney-Bowes, Inc.
Procter & Gamble Co.
RCA
Raytheon Co.
Rockwell Manufacturing Co.

The Ryan Aeronautical Co.
Shell Development Company
The Singer Co.
Sperry Rand Corp.
Sundstrand Aviation
Sylvania
Teletype Corporation
Texaco Research Labs.
The Budd Co.
The Mitre Corp.
United Air Lines
United Aircraft Corp.
Uniroyal Chemical Co.
University of California
Varian Associates
Westinghouse Electric Corp.
Western Electric Co.
The Western Union Telegraph Co.
Western Electric Co. Inc.
Xerox Corporation

... and many, many others

Logic Design

The lecture notes total 184 printed pages and are available only to participants.

The Planning Board

This seminar has been developed through extensive field research by the Institute for Professional Development in consultation with RCA Institutes' Board of Technical Advisers, representing various technical research and educational activities of RCA and its subsidiaries.

The People that Make it Happen.

B. I. Daggett	Director
J. H. Sneddon	Manager, Administration
D. B. Kenney	Industrial Sales
B. V. Ferguson	Direct Marketing
M. V. Mahoney	Research & Development
A. B. Peticolas	Administrator
J. B. Wetterau	Group Leader
E. Fleisher	Staff Member
M. C. Laguzzi	Staff Member
R. D. Lindskog	Staff Member
C. L. Pearce	Staff Member
P. Pennisi	Staff Member
C. H. Saville	Staff Member
R. E. Weiss	Staff Member

Each lecturer is dedicated to the profession—has engineering experience and is an accomplished teacher. His full-time job includes researching, assembling and presenting material in an effective manner.

RCA Institutes, Inc.

Institute for Professional Development
132 West 31st Street
New York, New York 10001

Please reserve a place for me at your five-day seminar on LOGIC DESIGN at _____

My understanding is that the registration fee of \$425.00 includes attendance, materials and luncheons. A group rate of \$350.00 per person is available to five or more enrollments submitted at the same time.

Name _____

Firm _____

Address _____

Zip Code _____

Title _____

☐ Enclosed is my check

☐ Please bill my firm

I should like to bring along _____ of my key men, subject to the rates and prerequisites quoted in this folder. You'll find their names and titles in the attached memo.

Logic Design



A Syllabus on the Content of

Logic Design

A Five-day Educational Seminar
For Engineers Presented by
RCA Institutes

RCA

Logic Design

The purpose of the seminar:

1. To supplant the familiar methods of classical Logic and Boolean Algebra with numerical and matrix tools of far greater power.
2. To equip you with many of the latest engineering techniques used in Logic Design.
3. To enable you to select the most straightforward, practical approach for each design problem.
4. To give you the tools to achieve maximum reliability with minimum redundancy.
5. To illustrate the use of designation numbers and the Mahoney Map.
6. To train you in the selection of optimum mapping techniques for multiple input functions.
7. To teach you the interrelationship between multiple logic functions that can be utilized to maximize simplification.
8. To maintain your job effectiveness in the face of advancing technology.

The Program

In just five days we feel we can promise you an easy, systematic approach to many of your now difficult logic design problems. In fact, our files are bulging with letters testifying to the power of our unique approach.

Over one thousand companies in the United States have sent people to attend this intensive program of lectures, demonstrations and exercises.

You will receive instruction from a team of two staff members who are experienced in logic design and are skilled in effective teaching and communications methods.

Thousands of people embracing the spectrum from technical school graduate to doctorate have attended the seminar and found it to be of high value. The prerequisite is a bachelor's Degree in Mathematics, Engineering or Physics, or the equivalent. Engineering experience in switching circuits or digital systems may be substituted.

A glance at the table of contents reproduced below will give you an idea of the concentrated program we have planned for you.

Table of Contents

Introduction to Logic Design

The Building Block Concept, The Role of the Logic Designer, The Numerical Approach to Logic.

Review of Number Systems

Definitions and Number Concepts, Conversion From One Number System to Another, Binary Codes

Symbolic Logic

Propositional Operations/AND, OR, and NOT Functions; Boolean Algebra and Symbolic Logic; Implication, Equivalence, and Tautology

Set Theory

Elements and Sets, Application, Combination of Variables

Duality

Examples of Engineering Duals, Applications

The Matrix Approach to Logic

Designation Number Notation, The Basis, Designation Numbers of Boolean Elements and Functions, Logical Operations with Designation Numbers, Dual, Unique, and Primitive Functions

Logic Gates and Symbols

Project I

Forms of Functions

Sum-of-Products-Form (NAND), Product-of-Sums-Form (NOR), Mongrel Form, Canonical Forms

The Logic Map

Definitions and Basic Concepts, Development of the Mahoney Map, The Map in n Variables, Reading the Logic Map, Rules of Map Couples

Applications of the Map

Conversion to NAND Circuits, Mongrel or Mixed Form, Conversion to NOR Circuits, Other Uses of the Map

Design of Combinational Circuits

Project II

Constraints in Logic Design

Resolution of Constraints

Logical Dependence

Dependent Functions in Logic Design

Multiple Function Design

Common Terms, Pyramiding, Minterm Procedure, Maxterm Procedure, Minterm/Maxterm Building Blocks

The Multiple Function Matrix

The Two-Level Minterm Matrix, The Two-Level Maxterm Matrix

Matrix Simplification

Application of Implication to Simplification of Minterm Matrix Arrays, Simplifying Maxterm Arrays

Project III

NAND and NOR Logic Design

NAND and NOR Functions, Integrated NAND and NOR Gates, NAND and NOR Logic Design

Logic Package Characteristics

The Unit Load, Fan-Out, Rise Time and Fall Time, Re-Shaping, Delay Time, Active Versus Passive Gating

Recursive Circuits

The SR Flip-Flop, The Shift or Delay Type Flip-Flop, The Complementing or Type T Flip-Flop, The Steering Network, Integrated Circuit J-K Flip-Flops, Dual Rank Circuits

Project IV

Serial Counters

Modulus 2^n Exponent Counters, Count-Down Binary Counters, Gated Binary Counters, Counters Using Binary Codes

Synchronous Counters

General Design Procedure for Parallel Counters, Using Steered and JK Flip-Flops, Cycle Counters

Flip-Flop Registers

Storage with Parallel Transfer, Complementmentation, Shift Registers, Parallel-to-Serial Conversion, Serial-to-Parallel Conversion, Synchronous Delay Line, The Circulating Register, A Precision One-Shot, Waveform Generation, Design Procedure for Wave-shaping, An All-Waveform Generator.

Binary Subtraction

Parallel Binary Addition, Serial Binary Addition.

Decoding and Encoding Circuits

Decoding Binary Words, Binary Coded Decimal-to-Decimal Read-Out, Multiple Level Matrices, Encoding Circuits

Seminar Location



We have chosen the site of the Sheraton Motor Inn for the presentation of the seminar, Logic Design.

The Sheraton, located in Syracuse, New York, with complete facilities designed to ensure your comfort and meet your needs, is located at:

Exit 35, New York State Thruway
Thompson Rd. at Court Street
Syracuse, New York 13206

For room reservations, call the hotel directly. Telephone (315) HO 36601

Remember the dates:

Nov. 11-15, 1968
8:30 a.m. to 4:30 p.m.

Telephone answering service will be provided during seminar hours.

RCA

Registration Information

Registration Policy . . .

Seminars will be limited in size, and registrations will be accepted in the order received. Substitution of applicants may be made any time prior to the opening of the seminar. Additional registration information may be obtained by phoning our registrar's office – (212) 689-7200 extension RR 884. Tentative registrations will be accepted by phone with space being reserved until the necessary paper work can be completed.

Cancellation Policy . . .

Cancellation of registration will be honored and entire fee refunded, if written notification is received no later than two weeks prior to the seminar. A fee of \$25.00 will be charged for other cancellations.

Registration Fee . . .

Registration fee of \$425.00 includes attendance, luncheons, coffee breaks and a complete package of reference material. The reference material will be issued at the opening session and is available only to seminar participants. A group rate of \$350.00 per participant is offered for five or more enrollments submitted together.

Hotel Accommodations . . .

RCA Institutes has reserved a block of rooms in each seminar hotel. Your hotel room is not included in the registration fee. Please arrange your own room accommodations directly with the hotel, with reference to RCA Institutes' seminar.